

# **CENTRIFUGAL FORCE-ACTIVATED SIGNAL LIGHT**

## **ASSEMBLY FOR VEHICLES**

### **BACKGROUND OF THE INVENTION**

#### **1. Field of the Invention:**

5           The present invention relates to lights for vehicles and, more particularly, to a centrifugal force-activated signal light assembly for installation in the wheels of a vehicle and adapted to emit light intermittently upon running of the vehicle.

#### **2. Description of the Related Art:**

10           People may attach reflecting paper or lenses to their vehicle to give a warning signal in the dark. However, these reflecting paper or lenses wear quickly with use. Further, these reflecting paper or lenses do not give any warning signal actively when in the dark without the radiation of an external  
15 light source.

          Therefore, it is desirable to provide a centrifugal force-activated signal light assembly for vehicles that eliminates the aforesaid problem.

### **SUMMARY OF THE INVENTION**

20           The present invention has been accomplished under the circumstances in view. According to one aspect of the present invention, a metal weight is suspended from a metal conical

spring at the bottom side of a set of battery cells inside a metal casing and vibrated to touch the metal casing intermittently upon running of the vehicle wheel in which the assembly is installed, causing the LED to flash. According to another aspect  
5 of the present invention, a ring cushion is provided to space the respective lead wire of the LED from the corresponding terminal of the battery cells, keeping the circuit off when the vehicle is immovable. According to still another aspect of the present invention, the casing has a bottom screw hole for fastening to  
10 the air valve of a vehicle wheel. According to still another aspect of the present invention, a mounting plate is provided for fastening the casing to the spokes of a vehicle wheel.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is an elevational view of a centrifugal  
15 force-activated signal light assembly according to the present invention.

FIG. 2 is an exploded view of the centrifugal force-activated signal light assembly according to the present invention.

20 FIG. 3 is a sectional assembly view of the centrifugal force-activated signal light assembly according to the present invention.

FIG. 4 is a schematic drawing of the present invention, showing the weight touched the inside wall of the casing, the LED turned on.

FIG. 5 is a sectional view of the present invention, showing the centrifugal force-activated signal light assembly immovable, the circuit opened.

FIG. 6 shows centrifugal force-activated signal light assemblies installed in a vehicle wheel according to the present invention.

FIG. 7 is an exploded view in section of the present invention, showing the relationship between a centrifugal force-activated signal light assembly and the air valve of a vehicle wheel.

FIG. 8 is an exploded view in an enlarged scale of a part of FIG. 6.

FIG. 9 is an exploded view of an alternate form of the centrifugal force-activated signal light assembly according to the present invention.

FIG. 10 is a sectional assembly view in an enlarged scale of FIG. 9.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIGS. 1~5, a centrifugal force-activated

signal light assembly **1** for vehicles in accordance with the present invention is shown comprised of a metal casing **2**, an electrically insulative battery holder **22**, a metal conical spring **23**, a metal weight **24**, a set of battery cells **25**, a ring cushion **3**,  
5 a circuit board **4** carrying a LED (or bulb) **41**, and a metal cover **5**.

The metal casing **2** comprises a base **21**, a cylindrical chamber **212** perpendicularly upwardly extended from the base **21**, an outer thread **211** extended around the periphery of the  
10 cylindrical chamber **212**, a locating groove **2121** in the inside wall **213** of the cylindrical chamber **212**, and a bottom screw hole **214** at the center of the bottom side of the base **21**.

The battery holder **22** is shaped like a stub tube mounted in the locating groove **2121** inside the cylindrical chamber **212**  
15 of the casing **2**, having an annular inside flange **221** suspended in the bottom open side.

The metal conical spring **23** is inserted through the bottom open side of the battery holder **22**, having the top side of relatively greater diameter fastened to the annular inside flange  
20 **221** of the battery holder **22** and the bottom side of relatively smaller diameter spaced below the battery holder **22** at a distance.

The metal weight **24** is fastened to the metal conical spring **23** and suspended in the cylindrical chamber **212** below the battery holder **22** without touching the inside wall **213** of the cylindrical chamber **212**, having an annular groove **241** extended  
5 around the periphery and fastened to the bottom side of the metal conical spring **23**.

The battery cells **25** are mounted in the cylindrical chamber **212** of the casing **2** and supported on the metal conical spring **23**, and connected in series with one terminal (for  
10 example, the negative terminal) disposed in contact with the metal conical spring **23**.

The metal cover **5** is fastened to the casing **2** to close the cylindrical chamber **212**, having an inner thread **53** threaded onto the outer thread **211** of the casing **2**, a reflector **51** provided  
15 at the top side and curved inwards, and a center hole **511** through the center of the reflector **51**.

The circuit board **4** is mounted inside the cover **5**, keeping the LED **41** extended out of the center hole **511**. The LED **41** has one lead wire (positive pole) adapted to contact the  
20 other terminal (positive terminal) of the battery cells **25** and the other lead wire (negative pole) connected to the inside wall of the metal cover **5**.

The ring cushion **3** is mounted in between the battery cells **25** and the circuit board **4**, keeping the positive pole lead wire of the LED **41** spaced above the positive terminal of the battery cells **25**.

**5** Referring to FIGS. 6-8 and FIGS. 3~5 again, by means of the bottom screw hole **214** of the casing **2**, the centrifugal force-activated signal light assembly **1** can be fastened to the air valve **61** of a vehicle wheel **6**, or the fixed screw rod **721** of a mounting plate **72**, which is then fastened to the spokes **71** at the  
**10** rim **7** of the vehicle wheel **6**. When the wheel **6** stands still, the weight **24** does not contact the inside wall **213** of the cylindrical chamber **212** of the casing **2**, and therefore the circuit is at an open status. During rotation of the wheel **6**, the metal conical spring **23** is vibrated, thereby causing the metal weight **24** to  
**15** touch the inside wall **213** of the cylindrical chamber **212** intermittently. At this time, the battery cells **25** are moved to compress the ring cushion **3** and to touch the positive pole lead wire of the LED **41** intermittently, and therefore the circuit is alternatively closed and opened, and the LED **41** is caused to  
**20** flash.

In the aforesaid embodiment, the casing **2** and the cover **5** are made of metal. Alternatively, the casing **2** and the cover **5**

can be molded from plastics and then respectively electroplated with a layer of electrically conducting material.

FIGS. 9 and 10 show an alternate form of the centrifugal force-activated signal light assembly. According to this embodiment, light emitting semiconductor chips **42** are used and installed in the circuit board **4** to substitute the aforesaid LED **41**, and a photosensitive switch **43** is installed in the circuit board **4** to control connection of the battery cells **25** to the light emitting semiconductor chips **42** subject to the intensity of surrounding light. The light emitting semiconductor chips **42** and the photosensitive switch **43** are exposed to the center hole **512** of the cover **5**. Further, transparent glue **513** is adhered to the reflector **51** and covered over the circuit board **4** to protect the light emitting semiconductor chips **42** and the photosensitive switch **43**.

A prototype of centrifugal force-activated signal light assembly for vehicles has been constructed with the features of FIGS. 1~10. The centrifugal force-activated signal light assembly for vehicles functions smoothly to provide all of the features discussed earlier.

Although particular embodiments of the invention have been described in detail for purposes of illustration, various

modifications and enhancements may be made without departing from the spirit and scope of the invention. For example, the fans used can be cooling fans for use in hot weather, or fans with electric heater means for use in cold weather. Accordingly, the  
5 invention is not to be limited except as by the appended claims.